

**Amendments to the Drawings:**

The attached replacement drawing sheet makes changes to Fig. 2. This sheet replaces the corresponding original sheet with Fig. 2.

Attachment: Replacement Sheet: Fig. 2

**REMARKS**

Claims 1-15 are pending in this application. By the Office Action, the drawings are objected to; claims 1-15 are rejected under 35 U.S.C. §102; and claims 14-15 are rejected under 35 U.S.C. §103. By this Amendment, Fig. 2 is replaced pursuant to the attached drawing sheet. Support for the changes to the drawings can be found in pages 3-4 of the application. No new matter is added. Reconsideration of the application in view of the above amendments and the following remarks is respectfully requested.

**I. The Drawings Satisfy All Formal Requirements**

The Office Action objects to the drawings under 37 C.F.R. §1.83(a). Fig. 2 is replaced pursuant to the attached drawing sheet. In particular, these changes include a plurality of heat sinks to correspond to the application. Support for the changes to the drawings can be found in pages 3-4 of the application. Reconsideration and withdrawal of the objection to the drawings are respectfully requested.

**II. Rejection Under 35 U.S.C. §102(e)**

The Office Action rejects claims 1-15 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 7,170,151 to Elpedes (hereinafter "Elpedes"). Applicants respectfully traverse the rejection.

**a. Claims 1-11**

The Office Action asserts that Elpedes discloses a device for cooling an exothermic electrical component, wherein, *inter alia*, the radiator is thermally coupled to the dissipating mass by at least one heat sink formed by an autogenous weld, as recited in independent claim of the present application and referenced in claims 2-11. This assertion is incorrect.

Elpedes describes a heat sink or slug (102) with a submount (108) mounted on the heat sink. The heat sink has a top mating surface (104) that is solder wettable and the submount has a bottom mating surface (109) that is also solder wettable. (Elpedes, col. 2,

lines 23-29; 41-45). A solder paste is deposited on the top mating surface and the submount is placed on the solder paste. The solder paste aligns the bottom mating surface to the top mating surface, enabling alignment of the submount to the heat sink "by the surface tension of the molten solder", (Elpedes, col. 2, lines 50-53), and also by the wettable surfaces of the top mating surface and bottom mating surface that enable liquid solder paste to be spread thereon. (Elpedes, col. 2, lines 45-47).

In the present application, Applicants describe an autogenous weld as being "created by the melting of the two materials." (See page 2, lines 11-13). Based on the above, Elpedes fails to teach or anticipate a device for cooling an exothermic electrical component having, *inter alia*, at least one heat sink formed by an autogenous weld, as recited in independent claim 1 of the present application. Put another way, since the weld in Elpedes is not formed by melting the submount and the heat sink, it is unreasonable to assert that the weld in Elpedes is formed by a molten solder, and thus it fails to teach or anticipate an autogenous weld as recited in the present application.

In addition, the autogenous welding as claimed in the present application enables having a thermal link between one face of the dissipating mass and one face of the radiator created by the melting of the two materials, and the weld is sufficiently localized to avoid damage to the electrical component. (See page 2, lines 11-19). Conversely, in Elpedes the solder extends itself over the entire face of the submount and heat sink and as a result is not localized.

For at least these reasons, Applicants respectfully submit that Elpedes fails to teach or anticipate a device for cooling an exothermic electrical component having, *inter alia*, at least one heat sink formed by an autogenous weld, as claimed in independent claim 1. Claims 2-11 variously depend from claim 1 and are patentable for at least the reasons that claim 1 is

patentable, as well as for the additional features they recite. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

**b. Claims 12-15**

The above discussion with respect to claims 1-11 is incorporated herein by reference. The Office Action asserts that Elpedes discloses a structure as described in independent claim 1 of the instant application. This assertion is incorrect for the reasons as stated above.

Elpedes further fails to teach or anticipate both: (1) a method in which a plurality of heat sinks are formed, as described in claim 12 of the present application; and (2) an additional step of fixing the component to a support separate from the radiator as described in the present application. (See page 3). Instead, in Elpedes the solder paste is deposited on the mating surfaces between the heat sink and the submount so as to extend across the entire area of both mating surfaces as a single element, not as a plurality of heat sinks, (Elpedes, Fig. 2) and the solder in Elpedes is formed in a single step by a "conventional reflow process". (Elpedes, col. 2, lines 49-50; col. 3, lines 24-25).

For at least these reasons, Applicants respectfully submit that Elpedes fails to teach a method of producing a device for cooling an exothermic electrical component having, *inter alia*, a plurality of heat sinks as described in claim 12 of the instant application. Claims 13-15 variously depend from claim 12 and are patentable for at least the reasons that claim 12 is patentable, as well as for the additional features they recite. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

**III. Rejection Under 35 U.S.C. §103**

The Office Action rejects claims 14-15 under 35 U.S.C. §103(a) as unpatentable over Elpedes in view of U.S. Patent No. 6,903,380 to Barnett (hereinafter "Barnett"). Applicants respectfully traverse the rejection.

The above discussion with respect to claims 1-11 and 12-15 is incorporated herein by reference. The Office Action asserts that the method steps described in claims 14-15 of the instant application are necessitated by the structure disclosed in Elpedes. However, Elpedes cannot reasonably be said to disclose or anticipate a step of laser welding through the support formed by the thermally conductive substrate (120). (Elpedes, col. 3; lines 10-15; 21-25).

Nowhere does Elpedes teach or suggest the use of a laser. It is well known in the art that a laser enables localized welding to occur at a high intensity on limited areas of a device, in order to avoid damaging surrounding areas or components of the device. Conversely, Elpedes appears to suggest the use of a heating source, such as a high temperature furnace, to heat the entire device during the welding process step wherein "the liquidous temperature of solder (129) is higher than that of solder (124)...(t)his prevents the subsequent reflow process from disturbing the soldered parts from previous reflow processes." (Elpedes, col. 3; lines 46-49). Therefore, Elpedes cannot reasonably be considered to have suggested or disclosed a step of laser welding as described in the present application.

The Office Action, on page 5, further asserts that Elpedes discloses a device in which the support is made from material transparent to a wavelength of a laser welding head. The Office Action relies on Elpedes, col. 3; lines 10-12 in support of this assertion. This interpretation is incorrect for at least the reason that Elpedes cannot reasonably be considered to have suggested or described a support material transparent to a wavelength of a laser welding head by describing a device having a substrate with a top mating surface that is "solder wettable." (Elpedes, col. 3; lines 10-12).

Besides, the Office Action later concedes that Elpedes fails to disclose a support made from a material transparent to a wavelength of a laser welding head, contrary to its previous assertion on page 5. The Office Action relies on Barnett to overcome this deficiency. However, Barnett does not disclose, teach or suggest a support that is made from a material

transparent to a wavelength of a laser welding head. Instead, Barnett describes a leadframe (27) that may be "laser welded," which cannot reasonably be interpreted to describe a support made from a material transparent to a wavelength of a laser welding head in which the autogenous welding is carried out through the support, as recited in claim 14 of the present application. (Barnett, col. 7; lines 57-65).

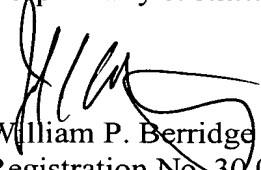
In view of the foregoing, any combination of the cited references fails to teach or suggest all of the positively recited claim features, in particular a method for producing a device wherein, *inter alia*, the autogenous welding is carried out using a laser welding head and the support is made from a material transparent to a wavelength of a laser welding head in which the autogenous welding is carried out through the support. The references thus would not have rendered the claimed invention obvious. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

#### **IV. Conclusion**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application is earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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WPB:SQL/rle

Attachment:

Replacement Sheet: Fig. 2

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